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TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35.U.S.C. 371

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INTERNATIONAL APPLICATION NO	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/GB99/01031	April 21, 1999	April 21, 1998

TITLE OF INVENTION
DECISION AID

APPLICANT(S) FOR DO/EO/US
Sean Christopher Martin and David William Nathaniel Sharp

Applicant herewith submits to the United States Designated /Elected Office (DO/EO/US) the following items and other information:

1. [x] This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.
2. [ ] This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.
3. [x] This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(I).
4. [x] A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. [x] A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. [x] is transmitted herewith (required only if not transmitted by the International Bureau).
   b. [ ] has been transmitted by the International Bureau.
   c. [ ] is not required, as the application was filed in the United States Receiving Office (RO/US).
6. [ ] A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. [x] Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
   a. [ ] are transmitted herewith (required only if not transmitted by the International Bureau).
   b. [ ] have been transmitted by the International Bureau
   c. [ ] have not been made; however, the time limit for making such amendments has NOT expired.
   d. [x] have not been made and will not be made.
8. [ ] A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. [ ] An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. [ ] A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other document(s) or information included:

11. [x] An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. [ ] An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. [ ] A FIRST preliminary amendment.
    [ ] A SECOND or SUBSEQUENT preliminary amendment.
14. [ ] A substitute specification.
15. [ ] A change of power of attorney and/or address letter.
16. [x] Other items or information:

Form PCT/IPEA/429
Response to Examiner's communication of 3rd July 2000 for PCT/GB99/01031
Response to first written opinion for PCT/GB99/01031
Telefax of telephone interview for PCT application GB99/01031
Form PCT/IPEA/408
Form PCT/IB/332
Form PCT/IPEA/402
Form PCT/IPEA/401
Form PCT/IB/308
Form PCT/IB/304
Form PCT/RO/101
Information Disclosure Statement, Form PTO-1449 and references

[redacted]ATIONAL APPLICATION NO GB99/01081 09/673790	INTERNATIONAL FILING DATE April 21, 1999	PRIORITY DATE CLAIMED April 21, 1998

17. [x] The following fees are submitted:

CALCULATIONS PTO USE ONLY

Basic National Fee (37 CFR 1.492(a)(1)-(5):

Neither international preliminary examination fee (37 CFR 1.482)

Nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO (1.492(a)(3)) $1,000.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO (1.492(a)(5) $860.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO(1.492(a)(2)) $710.00

International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) (1.492(a)(1)) $690.00

International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) ..... $ 100.00

ENTER APPROPRIATE BASIC FEE AMOUNT =	$860.00	
Surcharge of $130.00 for furnishing the oath or declaration later than [ ] 20 [ ] 30 months from the earliest claimed priority date (37 C.F.R. 1.492)(e)).	$	

Claims	Number Filed	Number Extra	Rate	$	
Total Claims	8 -20=	0	X $ 18.00	$0	
Independent Claims	1 -3=	0	X $ 80.00	$0	
Multiple dependent claim(s) (if applicable)			+ $270.00	$	

TOTAL OF ABOVE CALCULATIONS =	$0	
Reduction by ½ for filing by small entity, if applicable. Verified Small Entity statement must also be filed. (Note 37 CFR 1.9, 1.27, 1.28).	$	
SUBTOTAL =	$860.00	
Processing fee of $130.00 for furnishing the English translation later than [ ] 20 [ ] 30 months from the earliest claimed priority date (37 CFR 1.492(f)). +	$	
TOTAL NATIONAL FEE =	$	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). $40.00 per property +	$	
TOTAL FEES ENCLOSED =	$860.00	
	Amt. refunded	$
	charged	$

a. [x] A check in the amount of $860.00 to cover the above fees is enclosed.

b. [ ] Please charge our Deposit Account No. 02-4377 in amount of $___ to cover the above fees. A copy of this sheet is enclosed.

c. [x] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 02-4377. A copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

BAKER BOTTS L.L.P.
30 Rockefeller Plaza
New York, New York 10112-4498

Signature

October 20, 2000
Date

31,300
Registration No.

Decision Aid

Field of the invention

The present invention relates to technical implementations of methods of aiding decisions when deciding between a plurality of similar products, services or control strategies, in particular to such implementations which use weightings of a number of relevant factors. In particular, the present invention relates to a decision aid for a user engaged in a selection activity using an interaction device connected to the Internet or another communications network.

Background Art

Consider a situation where a potential customer is faced with selecting the most appropriate product or service from a selection that is great in number.

It can appear to the customer that the products or services are quite similar and their differences are not that apparent, and further, the decision-making process is complicated by the extent of the selection. A customer may typically lack the confidence that any particular product or service is a good match with their needs, and in consequence such a customer will often not reach a decision to purchase even though very suitable products are offered.

There is therefore a need for a decision aid that assists a customer in purchasing decisions. Such a decision can produce a short list of products or services which are a good match with the customer's needs together with justification or explanation relating to the selection in the short list. Such a short list can allow the customer to make the easier final choice from say twenty products or services that appear to the user only to be generally suitable.

'Decision Guide' - a software package that allows users to slide sliders one at a time in order to state how important various features of a holiday are is known in the art. This package treats features uniformly in identifying holidays which match the set of criteria that are important to the user.

Rackham's book on 'Making Major Sales' lays out the theory that consumers' behaviour can be modelled by:

- identifying a set of criteria that the consumer considers important in evaluating a product or service;

- ranking the importance of these selection criteria to the customer;

- identifying leading 'best match' products and services according to a principle based on the match with criteria ranked highly by the consumer in preference to the match with those criteria ranked lowly by the consumer.

However, Rackham does not indicate a mechanism for implementing his theory.

Present systems do not allow decision makers to non-linearly weight their decision criteria in order to arrive at an optimum ranking of products/services.

One accepted account of an overall purchase-decision-making process for a person engaged in the activity of selecting a product or service (hereafter, for simplicity, referred to simply as a product) suggests that there are three individual decision-making steps. The first step concerns the person recognising the need for a product leading to a decision that the person 'wants one of these products'. The second step concerns the person evaluating the options

leading to a decision that the person 'wants a particular product'. The third step concerns the person overcoming doubts that may arise leading to a decision to proceed with and conclude the selection/purchase activity.

The limitations of many current techniques of aiding a decision maker are evident when they are compared with this three-step account of the decision-making processes.

For example, many electronic commerce web sites make good use of graphics and multimedia to engage the user in the desirability of having one of the products being offered, thus helping the user through the first decision-making step. Also, many web sites provide reassurance about the final selection/purchase activity such as the security of financial transactions, the return of products, support and warranty, thus helping the user through the third decision-making step. Such web sites thus adequately aid a user with the first and third steps, but do not provide aid for the second step.

Many web sites simply present information, and sometimes a considerable amount of information, describing each available product. This is done, presumably, with the expectation that a simple presentation of information about the products on offer will form a sufficient basis for the user to be able to evaluate the options and thus carry through the second step of the decision process. In practice this is not an effective technique and users of such web-sites often do not choose an option (i.e. stay at the first step of the decision-making process) or spontaneously make an ill-informed decision (i.e. miss out the second step of the decision-making process altogether because of information overload).

This conclusion is reached by considering a typical situation in electronic commerce. A good retailer is

generally considered to be one that offers a wide choice to the consumer. The choice offered in a conventional (non-electronic-based) retail environment often comprises a wide range of between ten and thirty or more similar products. A typical retail environment (i.e. a shop) is designed to make the decision process engaging and interesting so that consumers obtain satisfaction from the decision and selection process. However, when using a typical electronic interaction device, such as a personal computer connected to the Internet, it is very difficult (and often uninteresting) for a user to make a selection by browsing detailed large amounts of information about a lengthy succession of individual similar products.

It is generally possible for a user to make a detailed assessment of selection options from only a very limited range, perhaps as few as three similar products when using such an interaction device. The user's selection process is significantly impaired if there are more than about five similar products, if no assistance is provided for comparing information about the products. This is because it is generally difficult to compare information and so the comparison process becomes a repetitive mental chore that quickly leads to boredom, which in turn leads to distraction thus making it easy for the consumer not to complete the decision-making activity.

The second decision-making step is thus a weak link in the chain of decision-making processes. However, attempts have been made to provide assistance with this decision-making process.

A first example of such an attempt to provide decision-making assistance concerns the presentation of a summary display comprising a synopsis of the many products that are available. A user can select one of these products and request more detailed information regarding that product -

held on a separate web page on a remote server. After examining that information the user returns to the summary page and considers an alternative product. This technique is referred to colloquially as a 'pogo-stick' since it involves the user jumping up and down between a sequence of web pages. It is difficult for the user to compare products because detailed information is shown about only one product at one time and navigation through the information is inhibited by the delays that occur when accessing information from a remote server.

A second example of such an attempt to provide decision-making assistance provides a user with a form with several fields or pull-down menus that are used by the user to convey preference information. The content of such a form is transmitted via the Internet and processed by a remote server. Recommendation logic executes on the remote server and recommendations are then transmitted back to the user. The delay between submitting a completed form and receiving recommendations can often amount to many seconds which is significantly greater than a human user's typical sub-second response time. Such delays induce boredom and allow the user to become distracted. Users might thus typically engage in only two or three alternative queries before being frustrated by the slow response and thus not conclude the decision-making process.

A third example of such an attempt to provide decision-making assistance concerns the improved use of sliders to indicate user preference information instead of making entries in fields in a form or by using pull-down menus. In this example the preference information is transmitted to recommendation logic executing on a remote server, as in the second example thus still leading to a slow response, and the user thus being unwilling to engage in exploring many alternatives.

Summary of the Invention

The invention provides an information sorting system for use in ranking a plurality of products/services according to the apparent desirability of each product/service to a system user which comprises a memory means which stores information on the plurality of services/products in the form of scores relating to a number of predetermined features of the products/services, a user interface which allows a user to indicate how important each of the number of predetermined features are to them calculating means for calculating a score for each product/service according to the following formula:

$$S_p = f(s_{i,p},\ I_i);\quad i \in \{1...N\};\quad p \in \{1...Q\}$$

wherein

S_p represents the overall score for a particular product p

$f(...)$ represents 'some function of'

$s_{i,p}$ represents the individual score for feature i of product p (in the range from s_{min} to s_{max})

I_i represents the importance of feature i to the user

N represents the number of predetermined features

Q represents the number of products/services

In another aspect, the present invention provides a technically-implemented decision aid method for aiding the decision-making process of a user for use in conjunction with an interaction device, which is connected to an information network, such as the internet, and a display means of which interaction device displays graphical preference mechanisms for entering, adjusting and displaying preference information and a synopsis of recommended products, wherein the method involves the following steps:

- Product data from a remote server is delivered to the interaction device, which product data contains information concerning products, relevant preference criteria such products, an evaluation of such products with regard to the preference criteria and instructions to the interaction device on how to configure the display means of the interaction device;

- The user is enabled to enter or adjust preference information using the graphical preference mechanisms;

- Within the interaction device, recommendation logic executes so that a recommendation of leading products is made substantially immediately following the user entering or adjusting preference information using the graphical preference mechanisms;

- Within the interaction device, display logic executes so that at least some elements of a synopsis of new recommendations are updated on the display substantially immediately after new recommendations are made by the recommendation logic;

- The user is enabled to indicate one of the recommended products using a pointing or similar selection device, such as a mouse.

In one preferred embodiment, the graphical preference mechanisms consist of graphical slider mechanisms.

In another preferred embodiment, the display means also displays detailed information about one of the recommended products.

In another preferred embodiment, the display means also displays a graphical pre-select mechanism for pre-selecting

a subset of the available products from which recommendations are to be made.

The present invention has at least the following advantages over prior art decision aids:

- The user may quickly explore the consequences of many different combinations of preferences while the display is updated with recommendations without apparent delay.

- The simultaneous display of graphical preference mechanisms, the synopsis of recommendations (and, in one preferred embodiment, detailed information about one of the recommended products) together provide the user with a visual context for the overall decision-making process. This visual context provides short term memory for the user thus assisting the decision-making process by reminding the user of their preferences, the recommended products (and, in one embodiment, the details concerning one of these products). This removes a mental chore that makes unaided comparison between similar products difficult. This visual context would be absent when the user sequentially has to navigate a sequence of web pages.

The present invention is unique because it provides highly interactive assistance for a user engaged in a selection task in a way that matches the psychological decision making processes of the user, and also while obtaining data about products from a remote server.

The invention provides a system which non-linearly weights various features and provides a fast, efficient manner for ranking a plurality of similar products/services.

The invention also provides a powerful means for translating a user's apparent preferences into a decision which may be

used in controlling a machine based on a machine operator's preferences.

Further objectives and advantages of the invention will become apparent from a consideration of the ensuing description.

Brief Description of Drawings

Figure 1: A schematic diagram showing a typical embodiment according to the invention implemented for a simple scenario involving a user choosing from amongst a plurality of mobile phones.

Figure 2: A schematic block diagram describing the main system components.

Figure 3: A schematic block diagram describing the principal interaction components.

Figure 4: A schematic block diagram describing the components of the interaction device.

Detailed description of the invention

The present invention provides a system which provides a user with a method of using Rackham's theories without having to understand them. The invention combines:

- a technique for interacting with the user that allows the user to indicate the importance of criteria for selecting a product or service, and in so doing allows the ranking of the criteria to be inferred;

- an algorithm for scoring which places a greater weight on the match of candidate products or services for criteria ranked highly by the user and which places a lesser weight on the match of candidate products or services for criteria ranked lowly by the user;

- a technique for ranking the scores of candidate products or services and displaying the leading products or services deduced to be the most appropriate for the user.

The present invention involves the novel combination of a user interface comprising several sliders with Rackham's hypothesis and with a novel weighted matching algorithm to rank products or services being chosen amongst. Each product or service is given a score based on how well its feature strengths match the needs of a user of the system of the invention as expressed by the positions of the sliders.

In general, the novel algorithm may be represented as follows:

$$S_p = f(s_{i,p}, I_i); \quad i \in \{1...N\}; \quad p \in \{1...Q\}$$

wherein

S_p represents the overall score for product p

$f(...)$ represents 'some function of'

$s_{i,p}$ represents the score for feature I of product p (in the range from s_{min} to s_{max})

I_i represents the importance of feature I to the user

N represents the number of features

Q represents the number of products or services

A simple implementable example of the general algorithm given above would be:

$$S_p = \Sigma_{i=1 \text{ to } N} \ (s_{i,p} \times I_i)$$

The system displays a score bar indicating how well a product or service matches the user's criteria.

The score value may be normalised relative to the maximum score a perfect product or service could obtain. Using the simple example given above, this would mean:

$$\text{Length of score bar} = \frac{\Sigma_{i=1 \text{ to } N} (s_{i,p} \times I_i)}{\Sigma_{i=1 \text{ to } N} (s_{max} \times I_i)} = \frac{\Sigma_{i=1 \text{ to } N} (s_{i,p} \times I_i)}{s_{max} \times \Sigma_{i=1 \text{ to } N} (I_i)}$$

In a preferred embodiment, the scoring algorithm is adjusted to give the same subjective ranking that would be chosen by a salesperson who is an expert at selling the range of products or services. This is achieved either by tuning the scoring algorithm according to heuristics or using neural network techniques to score the product match.

When used in a control system, the information sorting system of the current invention allows the control system to make qualitative choices between the various control strategies which the control system has available to it based on a system operator's indicated preferences - without a need for the system operator to do more than indicate these preferences. No prior art information sorting system allowed such a simple operator interaction with a controlled system.

Referring to Figure 2, a remote server (10) is a computing device that holds source reference data and program logic (11) for the electronic selection aid. The communications medium (20) connects the remote server (10) to the interaction device (30). The source reference data and program logic (11) is downloaded via the communications medium (20) to the interaction device (30) where it is held as reference data and program logic (60). The interaction device (30) comprises a display (40) and an input device

(50). The user (80) interacts with the interaction device (30) by means of the display (40) which convey information from the interaction device (30) to the user, and by means of the input device (50) which conveys information from the user to the interaction device.

Referring to Figure 3, the interaction device (30) comprises four principal components each comprising both a display and an input device, as follows:

The pre-selection component (41) and its associated input device (51) are optional, and may be used to select a subset from the total number of products available. This may include the use of radio buttons to select products with particular attributes, for example, selecting only portable products.

The preference display (42) indicates to the user the current preference settings, which are entered using the input device (52).

The recommendations display (43) indicates a synopsis of the recommendations that are a good match with the preference settings. The associated input device (53) can be used to select a particular product as being chosen or requesting more detailed information about a particular product.

The detailed display (44) presents detailed information about one of the recommended products. The associated input device (54) can be used to select a particular product as being chosen.

Referring to figure 4, display reference data (61) contains information controlling the layout of the displays on the interaction device (30). Product reference data (62) contains scores for each product with respect to each preference criterion. Algorithm selection data (63) contains

information controlling the behaviour of the recommendation logic (66). The group of items (61), (62) and (63) thus provide the reference data, which is part of (60), and which is used by other components of the interaction device. The remainder of (60) comprises the program logic modules: the preference control logic (65), the recommendation logic (66), the recommendation display control logic (67) and the detailed display control logic (68).

The pre-selection control logic (64) takes display reference data (61) and uses it to format the pre-selection display (41) and the associated input device (51). The pre-selection control logic indicates to the recommendation logic (66) whether recommendations are to be made from a subset of the available products.

The preference control logic (65) takes display reference data (61) and uses it to format the preference display (42). Preference control logic (65) also takes information from the associated input device (52) regarding preference information entered by the user and updates the preference display (42). It passes the preference information (71) to the recommendation logic (66).

The recommendation logic (66) uses algorithm selection data 63 and product reference data (62) to process preference information (71) and produces product recommendations (72). Several different algorithms may be used within the recommendation logic (66) where these may be as described above or based on a least squares best match algorithm, or other matching algorithms.

Product recommendations (72) are passed to the recommendation display control logic (67). Recommendation display control logic (67) uses display reference data (61) to format the recommendation display (43) and display the recommendations contained within product recommendations

(72). Recommendation display control logic (67) also responds to information from the associated input device (53) regarding (a) the selection of a particular product to identify a selected product (73), and (b) whether the user has chosen a particular product.

A selected product (73) is passed to the detailed display control logic (68). Detailed display control logic (68) uses this information and the display reference data (61) to format the detailed display (44). Detailed display control logic (68) also responds to information from the associated input device (54) if the user has chosen a particular product.

When the user chooses a product using input devices (53) or (54) the control logic modules (67) or (68) will send a reporting signal reporting the chosen product (82) or (83) to the remote server (10) via the communications medium (20) indicating that a choice has been made.

Under certain conditions the preference control logic (65) will also send a reporting signal (81) to the remote server (10) via the communications medium (20) indicating the preferences entered by the user. This can occur, for example, when the user chooses a particular product, but may also occur when a user requests more information on a particular product to be displayed on the detailed display (44). The reported preference information may subsequently be used for market research purposes.

The system of the present invention can allow the names, and other textual descriptions such as price, describing the recommended products to be displayed very quickly. It may be necessary for pictures of the recommended products to be requested from the remote server and displayed when they become available.

The display logic can present more detail about the indicated product on the display of the interaction device while the display also shows slider settings and the synopsis of recommended products. The user may so indicate simply by pointing, or hovering, the pointing device over the portion of the display where a synopsis of one recommended product is shown.

A limited number of leading recommendations may be displayed (typically three, as experience shows that a user can make a detailed comparison between three options). This aspect results in two advantages. Firstly, the user can examine detailed information about each option and re-examine it without apparent delay. This eases the task of making comparisons. Secondly, it is better to display several recommendations rather than a single recommendation as most users obtain satisfaction or enjoyment from a decision making process. If only one recommendation were made then this would deprive the user of the satisfaction or enjoyment that would have been obtained from a decision making process.

The user may request more information about a recommended product simply by pointing, or hovering, the pointing device over the portion of the display where a synopsis of the recommended product is shown. This allows the display to be updated rapidly when the user traverses the pointing device over a succession of synopses of recommended products, and the rapid update also eases the comparison of similar products.

Claims

1. A technically-implemented decision aid system,

which aids a user who is engaged in a selection task, such as a purchasing decision;

and, which comprises:

- a memory means which stores:

  - product data, which comprises data relating to a plurality of products and which product data is in the form of a plurality of product-feature-scores ($s_{i,p}$), wherein each individual product-feature-score ($s_{i,p}$) relates to one of a number of predetermined product-features (i) for one of the plurality of products (p) and wherein said product-feature-scores ($s_{i,p}$) are values which are constrained to be from predetermined intervals of values (s_{min} to s_{max}); and

  - user information, which comprises information relating to preferences of the user and which user information is in the form of a plurality of user-importance-scores (I_i) relating to the importance which the user attaches to each of the number of predetermined product-features (i) wherein the user-importance-scores (I_i) are values which are constrained to be from a predetermined interval of values which expresses a range of possible levels of importance of a product-feature to the user;

- a user interface which allows the user to interact with the decision aid and which comprises:

- an input device for entering data, such as user-importance-scores (I_i), into the decision aid; and

- a display device for outputting data to the user;

- a calculating means which:

- calculates an overall score (S_p) for each of the plurality of products as a function of product-feature-scores ($s_{i,p}$) and user-importance-scores (I_i); and

- ranks the plurality of products according to the calculated overall scores (S_p) to form a ranked list of products;

wherein the display device simultaneously displays:

- a current set of user-importance-scores (I_i); and

- at least a portion of the ranked list of products;

whereby the technically-implemented decision aid system provides the user with a visual context, which assists the decision-making process by reminding the user of the user-importance-scores (I_i) which have been entered whilst simultaneously displaying at least a portion of the ranked list of products.

2. A technically-implemented decision aid system according to claim 1 in which product data stored in the memory means further comprises detailed-product-information about each of the plurality of products and in which the display device further simultaneously displays detailed-product-information about one of the products

AMENDED SHEET

on the displayed portion of the ranked list of products.

3. A technically-implemented decision aid system according to claim 2 in which the product for which detailed-product-information is displayed may be selected by the user using the input device to indicate one of the products on the displayed portion of the ranked list of products for which detailed-product-information should be displayed.

4. A technically-implemented decision aid system according to any of the preceding claims in which product data is obtained from a remote server on an information network, such as the internet.

5. A technically-implemented decision aid system according to claim 4 in which configuration-information regarding the configuration of the display device is also obtained from the remote server and in which the display device is subsequently configured according to said configuration-information.

6. A technically-implemented decision aid system according to any of the preceding claims in which the input device comprises a graphical preference mechanism, such as a graphical slider mechanism, which displays a current set of user-importance-scores (I_i) while allowing the user to alter the current user-importance-scores (I_i).

7. A technically-implemented decision aid system according to any of the preceding claims which further comprises a pre-selecting means for pre-selecting the plurality of products as a subset from a larger plurality of products.

19 A 19.07.00

8. Computer software, particularly a computer program on a data carrier, which when run on a data processor, implements a technically-implemented decision aid system according to any of the preceding claims.

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Importance to the user
Product Features
Not Important
Very Important
Low Price
Large Display
Low Weight
Long Battery Life
On screen sliders allow user to indicate his requirements
Most Important
Large Display
Low Weight
Long Battery Life
Low Price
Least Important
Rackham's representation of the user's requirements
Strong
Large Display
Low Weight
Long Battery Life
Low Price
Weak
A good matching product has its strengths in areas that the user considers important
Strong
Low Price
Long Battery Life
Low Weight
Large Display
Weak
A poor matching product is weak in areas that the user considers important
Rank ordering translates the user's
slider input to Rackham's representation

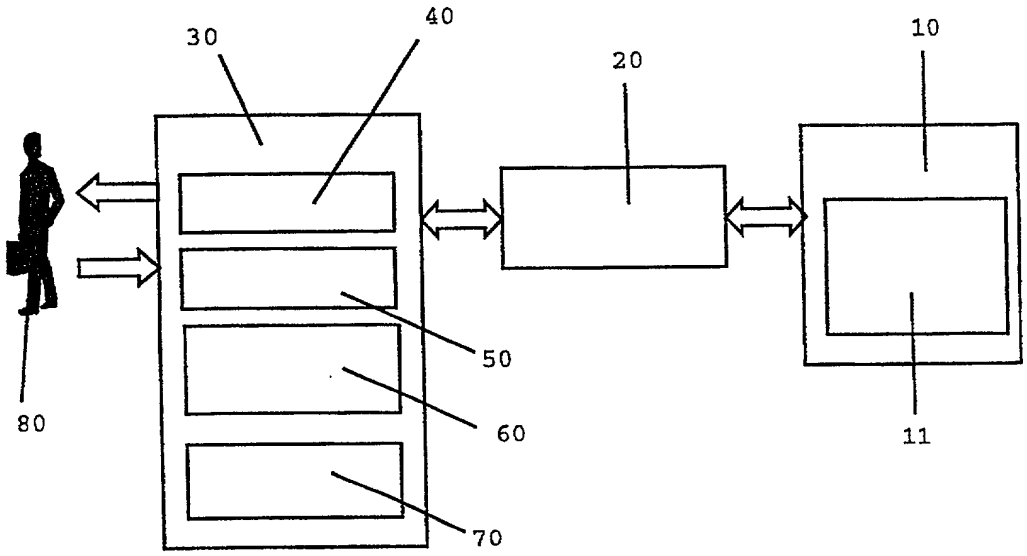

Figure 2

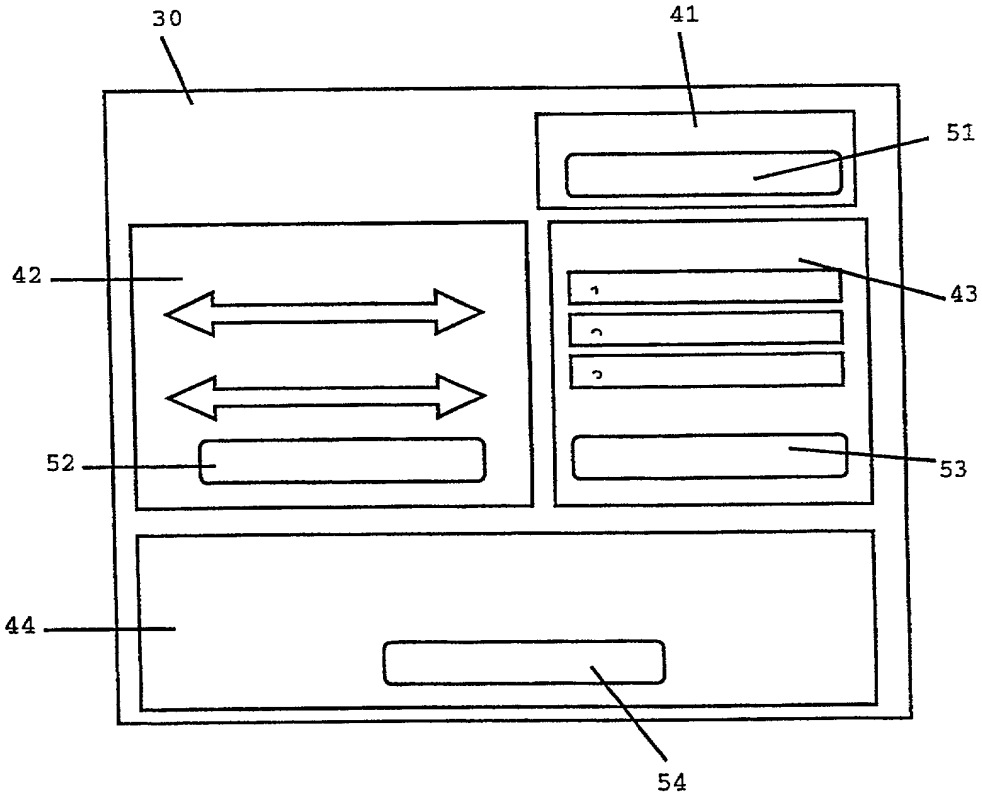

Figure 3

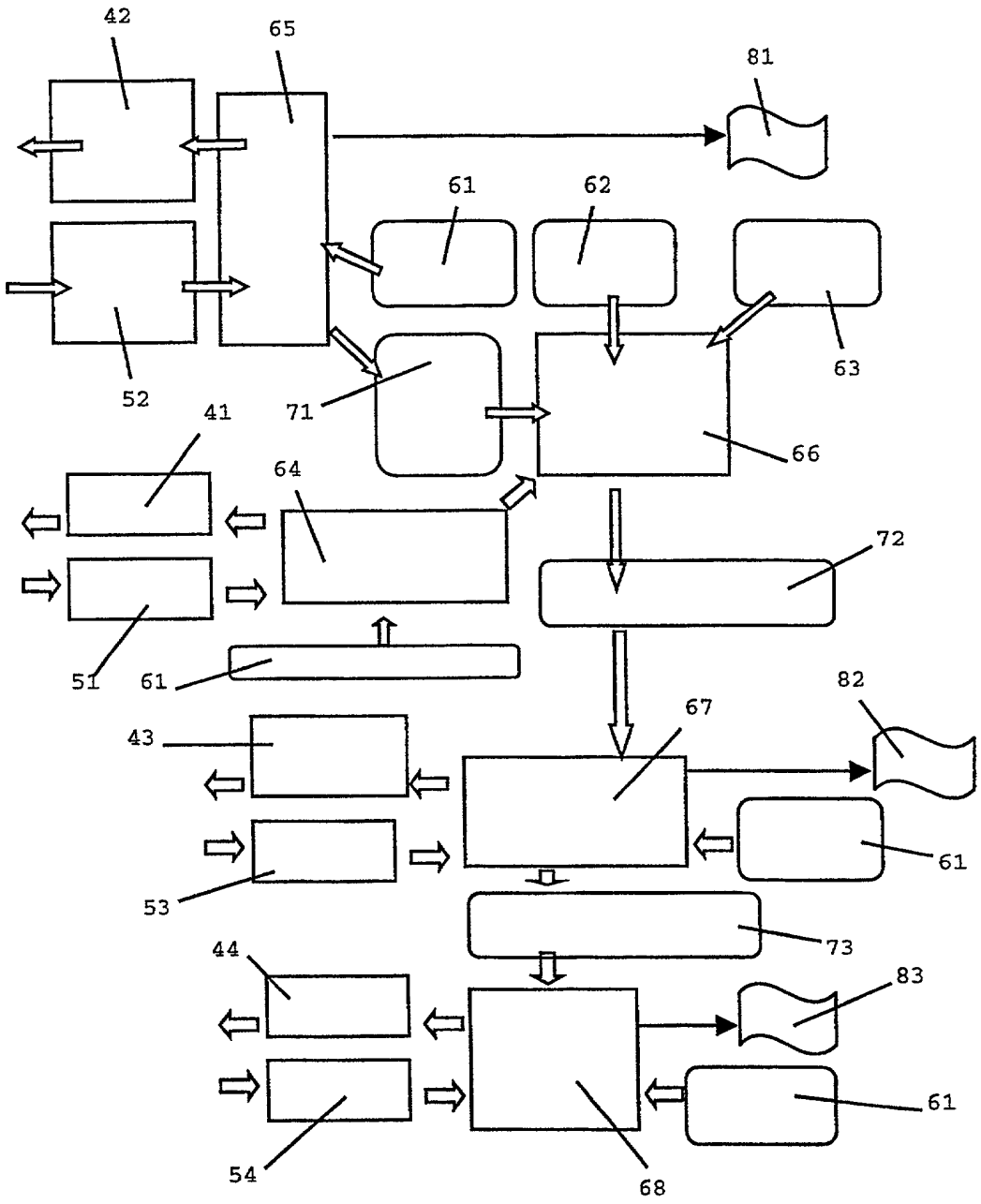
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Figure 4

MAR 1 2 2001
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COMBINED DECLARATION AND POWER OF ATTORNEY

(Original, Design, National Stage of PCT, Divisional, Continuation or C-I-P Application)

As a below named inventor, I hereby declare that:
My residence, post office address and citizenship are as stated below next to my name; I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

DECISION AID

This declaration is of the following type:

[] original
[] design
[X] national stage of PCT.
[] divisional
[] continuation
[] continuation-in-part (C-I-P)

the specification of which: *(complete (a), (b), or (c))*

(a) [ ] is attached hereto.
(b) [ ] was filed on 10/20/00 as Application Serial No. 09/673,790 and was amended on *(if applicable).*
(c) [X] was described and claimed in PCT International Application No. PCT/GB99/01031 filed on 4/21/99 and was amended on *(if applicable).*

Acknowledgement of Review of Papers and Duty of Candor

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of the subject matter claimed in this application in accordance with Title 37, Code of Federal Regulations § 1.56.

[ ] In compliance with this duty there is attached an information disclosure statement. 37 CFR 1.98.

Priority Claim

I hereby claim foreign priority benefits under Title 35, United States Code, § 119(a)-(d) of any foreign application(s) for patent or inventor's certificate or of any PCT International Application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT International Application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application on which priority is claimed

(complete (d) or (e))

(d) [ ] no such applications have been filed.
(e) [X] such applications have been filed as follows:

PRIOR FOREIGN/PCT APPLICATION(S) FILED WITHIN 12 MONTHS (6 MONTHS FOR DESIGN) PRIOR TO SAID APPLICATION			
COUNTRY APPLICATION NO.	DATE OF FILING (day, month, year)	DATE OF ISSUE (day, month, year)	PRIORITY CLAIMED UNDER 35 USC 119
			[ ] YES NO [ ]
			[ ] YES NO [ ]
			[ ] YES NO [ ]
ALL FOREIGN APPLICATION[S], IF ANY, FILED MORE THAN 12 MONTHS (6 MONTHS FOR DESIGN) PRIOR TO SAID APPLICATION			
EP 98303046.1	21.04.98		[X] YES NO [ ]
			[ ] YES NO [ ]
			[ ] YES NO [ ]

Claim for Benefit of Prior U.S. Provisional Application(s)

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below:

Provisional Application Number	Filing Date

Claim for Benefit of Earlier U.S./PCT Application(s) under 35 U.S.C. 120

(complete this part only if this is a divisional, continuation or C-I-P application)

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior application(s) in the manner provided by the first paragraph of Title 35, United States Code § 112, I acknowledge the duty to disclose information as defined in Title 37, Code of Federal Regulations, § 1.56 which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

(Application Serial No.) (Filing Date) (Status) (patented, pending, abandoned)

(Application Serial No.) (Filing Date) (Status) (patented, pending, abandoned)

Power of Attorney

As a named inventor, I hereby appoint Dana M. Raymond, Reg. No. 18,540; Frederick C. Carver, Reg. No. 17,021; Francis J. Hone, Reg. No. 18,662; Joseph D. Garon, Reg. No. 20,420; Arthur S. Tenser, Reg. No. 18,839; Ronald B. Hildreth, Reg. No. 19,498; Thomas R. Nesbitt, Jr., Reg. No. 22,075; Robert Neuner, Reg. No. 24,316; Richard G. Berkley, Reg. No. 25,465; Richard S. Clark, Reg. No. 26,154; Bradley B. Geist, Reg. No. 27,551; James J. Maune, Reg. No. 26,946; John D. Murnane, Reg. No. 29,836; Henry Tang, Reg. No. 29,705; Robert C. Scheinfeld, Reg. No. 31,300; John A. Fogarty, Jr., Reg. No. 22,348; Louis S. Sorell, Reg. No. 32,439; Rochelle K. Seide Reg. No. 32,300; Gary M. Butter, Reg. No. 33,841; Marta E. Delsignore, Reg. No. 32,689; and Lisa B. Kole, Reg. No. 35,225 of the firm of BAKER BOTTS L.L.P., with offices at 30 Rockefeller Plaza, New York, New York 10112, as attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith

SEND CORRESPONDENCE TO:	DIRECT TELEPHONE CALLS TO:
BAKER BOTTS L.L.P. 30 ROCKEFELLER PLAZA, NEW YORK, N.Y. 10112 CUSTOMER NUMBER: 21003	BAKER BOTTS L.L.P. (212) 705-5000

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge

that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

FULL NAME OF SOLE OR FIRST INVENTOR	LAST NAME MARTIN	FIRST NAME SEAN	MIDDLE NAME CHRISTOPHER	
RESIDENCE & CITIZENSHIP	CITY CAMBRIDGE	STATE or FOREIGN COUNTRY GREAT BRITAIN	COUNTRY OF CITIZENSHIP GREAT BRITAIN	
POST OFFICE ADDRESS	POST OFFICE ADDRESS 20 CLARE STREET	CITY CAMBRIDGE	STATE or COUNTRY GREAT BRITAIN	ZIP CODE CB4 3BY
DATE 15th January 2001	SIGNATURE OF INVENTOR Sean Martin			
FULL NAME OF SECOND JOINT INVENTOR, IF ANY	LAST NAME SHARP	FIRST NAME DAVID	MIDDLE NAME WILLIAM NATHANIEL	
RESIDENCE & CITIZENSHIP	CITY ~~CAMBRIDGE~~ LONDON	STATE or FOREIGN COUNTRY GREAT BRITAIN	~~COUNTRY OF CITIZENSHIP~~ GREAT BRITAIN	
POST OFFICE ADDRESS	POST OFFICE ADDRESS ~~58A NATAL ROAD~~ 50 SNEATH AVENUE	CITY CAMBRIDGE	STATE or COUNTRY GREAT BRITAIN	ZIP CODE ~~CB1 3NY~~ NW11 9AH
DATE 7th Feb 2001	SIGNATURE OF INVENTOR			

Check proper box(es) for any added page(s) forming a part of this declaration

[ ] Signature for ninth and subsequent joint inventors. Number of pages added _____.

[ ] Signature by administrator(trix), executor(trix) or legal representative for deceased or incapacitated inventor. Number of pages added _____.

[ ] Signature for inventor who refuses to sign, or cannot be reached, by person authorized under 37 CFR 1.47. Number of pages added _____.